

REMARKS

Reconsideration of this application, as amended, is respectfully requested.

In this response, claims 1-6, 8, 11, and 15-22 have been amended. No claims have been canceled. No claims have been added. Support for the amendments is found in the specification, the drawings, and in the claims as originally filed. Applicants submit that the amendments do not add new matter.

Applicants reserve all rights with respect to the applicability of the Doctrine of Equivalents.

Claims 2-16, 18, and 21 were rejected under 35 U.S.C. §112, first paragraph.

Amended claim 2 reads as follows:

A wavelength division multiplexing passive optical network (WDM-PON) for performing bi-directional communication, the WDM-PON comprising:
at least two remote distribution nodes including a first remote distribution node and a second remote distribution node between a central office and a plurality of optical network units, each of the first remote distribution node and the second remote distribution node is located in a physically separate location, wherein the first remote distribution node and the second remote distribution node are connected to each other sequentially, wherein the first remote distribution node is configured to couple a first composite optical signal and a second composite optical signal to a first optical cable connected to the central office, wherein the first composite signal travels on the first optical cable in a first direction, and the second composite optical signal travels on the first optical cable in a second direction opposite the first direction, and wherein the first remote distribution node includes a series of band splitting filters configured to connect to the second remote distribution node comprising a first multiplexer/demultiplexer and a second multiplexer/demultiplexer coupled to at least two optical network units, wherein each of the first remote distribution node and the second remote distribution node are configured to separate at least one wavelength channel from the first composite optical signal distributed through that remote distribution node, wherein the series of band splitting filters are configured to split the first composite optical signal that includes all of the wavelength channels in a first wavelength band into a first subset of the wavelength channels and a second subset of the wavelength channels.

(Amended claim 2)(emphasis added)

Claim 2, as amended, is supported by at least Figure 2 and respective portions of the specification.

Therefore, applicants respectfully submits that the Examiner's rejection of claim 2, as amended, under 35 U.S.C. §112, second paragraph, has been overcome.

Given that claims 3-5 depend from amended claim 2, and add additional limitations, applicant respectfully submits that the Examiner's rejection of claims 2-5 under 35 U.S.C. §112, second paragraph, have been overcome.

Amended claim 6 reads as follows:

A wavelength division multiplexing passive optical network (WDM-PON) for performing bi-directional communication, the WDM-PON comprising: at least two remote distribution nodes including a first remote distribution node and a second remote distribution node between a central office and a plurality of optical network units, each of the first remote distribution node and the second remote distribution node is located in a physically separate location, wherein the first remote distribution node and the second remote distribution node are connected to each other sequentially, wherein the first remote distribution node has an optical interleaver configured to couple a first composite optical signal and a second composite optical signal to a first optical cable connected to the central office, wherein the first composite signal travels on the first optical cable in a first direction, and the second composite optical signal travels on the first optical cable in a second direction opposite the first direction, and wherein the first remote distribution node is configured to connect to the second remote distribution node coupled to at least two optical network units, wherein each of the first remote distribution node and the second remote distribution node are configured to separate at least one wavelength channel from the first composite optical signal distributed through that remote distribution node, wherein the optical interleaver is configured to split the first composite optical signal in a first wavelength band into a first portion consisting of odd numbered wavelength channels and a second portion consisting of even numbered wavelength channels.

(Amended claim 6)(emphasis added)

Claim 6, as amended, is supported by at least Figure 3 and respective portions of the specification.

Therefore, applicants respectfully submits that the Examiner's rejection of claim 6, as amended, under 35 U.S.C. §112, second paragraph, has been overcome.

Given that claims 7-10 depend from amended claim 6, and add additional limitations, applicant respectfully submits that the Examiner's rejection of claims 7-10 under 35 U.S.C. §112, second paragraph, have been overcome.

Amended claim 11 reads as follows:

A wavelength division multiplexing passive optical network (WDM-PON) for performing bi-directional communication, the WDM-PON comprising: at least two remote distribution nodes including a first remote distribution node and a second remote distribution node between a central office and a plurality of optical network units, each of the first remote distribution node and the second remote distribution node is located in a physically separate location, wherein the first remote distribution node and the second remote distribution node are connected to each other sequentially, wherein the first remote distribution node has a plurality of band splitting filters, and a first multiplexer/demultiplexer and a second multiplexer/demultiplexer coupled to the plurality of band splitting filters, wherein the first remote distribution node is configured to couple a first composite optical signal and a second composite optical signal to a first optical cable connected to the central office, wherein the first composite signal travels on the first optical cable in a first direction, and the second composite optical signal travels on the first optical cable in a second direction opposite the first direction, and wherein the first remote distribution node is configured to connect to the second remote distribution node coupled to at least two optical network units, wherein each of the first remote distribution node and the second remote distribution node are configured to separate at least one wavelength channel from the first composite optical signal distributed through that remote distribution node, wherein the first remote distribution node has the first multiplexer/demultiplexer coupled to at least two band splitting filters configured to split the first composite optical signal that includes all of the wavelength channels in a first wavelength band into a first subset of wavelength channels and a second subset of wavelength channels.

(Amended claim 11)(emphasis added)

Claim 11, as amended, is supported by at least Figure 4 and respective portions of the specification.

Therefore, applicants respectfully submits that the Examiner's rejection of claim 11, as amended, under 35 U.S.C. §112, second paragraph, has been overcome.

Given that claims 12-14 depend from amended claim 11, and add additional limitations, applicant respectfully submits that the Examiner's rejection of claims 12-14 under 35 U.S.C. §112, second paragraph, have been overcome.

Applicant respectfully submits that amended claim 15 is supported by at least Figure 5 and respective portions of the specification.

Therefore, applicants respectfully submits that the Examiner's rejection of claim 15, as amended, under 35 U.S.C. §112, second paragraph, has been overcome.

Applicant respectfully submits that amended claim 18 is supported by at least Figure 3 and respective portions of the specification.

Therefore, applicants respectfully submits that the Examiner's rejection of claim 18, as amended, under 35 U.S.C. §112, second paragraph, has been overcome.

Applicant respectfully submits that amended claim 21 is supported by at least Figure 5 and respective portions of the specification.

Therefore, applicants respectfully submits that the Examiner's rejection of claim 21, as amended, under 35 U.S.C. §112, second paragraph, has been overcome.

Claims 1, 4-5, 11-12, 14-17, 19-20 and 22 stand rejected under 35 U.S.C §103(a) as being unpatentable over U.S. Publication No. 2004/0033076 to Song ("Song") in view of U.S. Patent No. 6,512,614 to Saleh("Saleh").

Amended claim 1 reads, in part, as follows: " wherein the first remote distribution node, the second remote distribution node, and the third remote distribution node are connected to each other sequentially, wherein the first remote distribution node includes at least one filter configured to couple a first composite optical signal and a second composite optical signal to a first optical cable connected to the central office, wherein the first composite signal travels on the

first optical cable in a first direction, and the second composite optical signal travels on the first optical cable in a second direction opposite the first direction, and configured to connect to the second remote distribution node comprising at least two filters coupled to at least two optical network units, wherein each of the first remote distribution node and the second remote distribution node are configured to separate at least one wavelength channel from the first composite optical signal distributed through that remote distribution node, wherein the third remote distribution node comprises a multiplexer/demultiplexer. (emphasis added).

The Examiner noted that “Song does not teach that the second distribution node is coupled to at least two optical network units.”(Office Action, p. 5).

Song discloses the wavelength division multiplexing passive optical network system. More specifically, Song discloses the central office that transmits and receives optical signals transmitted from the remote nodes through a single optical fiber (paragraph [0095]). In particular, Song discloses that the add/drop device is equipped in each remote node (Figure 8, paragraph [0096]). Accordingly, Song fails to teach or suggest the first remote distribution node, the second remote distribution node, and the third remote distribution node that are connected to each other sequentially, wherein the second remote distribution node comprises at least two filters coupled to at least two optical network units, wherein each of the first remote distribution node and the second remote distribution node are configured to separate at least one wavelength channel from the first composite optical signal distributed through that remote distribution node, wherein the third remote distribution node comprises a multiplexer/demultiplexer, as recited in amended claim 1.

Saleh, in contrast, discloses WDM-based architecture for flexible switch placement in an access network. Saleh fails to teach or suggest the first remote distribution node, the second

remote distribution node, and the third remote distribution node that are connected to each other sequentially, wherein the second remote distribution node comprises at least two filters coupled to at least two optical network units, wherein each of the first remote distribution node and the second remote distribution node are configured to separate at least one wavelength channel from the first composite optical signal distributed through that remote distribution node, wherein the third remote distribution node comprises a multiplexer/demultiplexer, as recited in amended claim 1.

It is respectfully submitted that Saleh does not teach or suggest a combination with Song, and Song does not teach or suggest a combination with Saleh. It would be impermissible hindsight, based on applicant's own disclosure, to combine Saleh and Song.

Furthermore, even if Saleh and Song were combined, such a combination would still lack a first remote distribution node, a second remote distribution node, and a third remote distribution node that are connected to each other sequentially, wherein the second remote distribution node comprises at least two filters coupled to at least two optical network units, wherein each of the first remote distribution node and the second remote distribution node are configured to separate at least one wavelength channel from the first composite optical signal distributed through that remote distribution node, wherein the third remote distribution node comprises a multiplexer/demultiplexer, as recited in amended claim 1.

Therefore, applicants respectfully submit that claim 1, as amended, is not obvious under 35 U.S.C. §103(a) over Song in view of Saleh.

Given that claims 15-16 depend from amended claim 1, and add additional limitations, applicants respectfully submit that claims 15-16 are not obvious under 35 U.S.C. §103(a) over Song in view of Saleh.

Given that claims 17, 19-20, and 22 contain some limitations that are similar to those limitations set forth above, applicants respectfully submit that claims 17, 19-20, and 22 are not obvious under 35 U.S.C. §103(a) over Song in view of Saleh.

Amended claim 2 reads in part, as follows: “wherein the first remote distribution node includes a series of band splitting filters configured to connect to the second remote distribution node comprising a first multiplexer/demultiplexer and a second multiplexer/demultiplexer coupled to at least two optical network units, wherein each of the first remote distribution node and the second remote distribution node are configured to separate at least one wavelength channel from the first composite optical signal distributed through that remote distribution node.” (emphasis added).

In view of the above discussion, even if Song and Saleh were combined, such a combination would still lack a first remote distribution node and a second remote distribution node connected to each other sequentially between a central office and a plurality of optical network units, wherein first remote distribution node includes a series of band splitting filters configured to connect to the second remote distribution node comprising a first multiplexer/demultiplexer and a second multiplexer/demultiplexer coupled to at least two optical network units, and wherein each of the first remote distribution node and the second remote distribution node are configured to separate at least one wavelength channel from the first composite optical signal distributed through that remote distribution node, as recited in amended claim 2.

Given that claims 4-5 depend from amended claim 2, and add additional limitations, applicants respectfully submit that claims 4-5 are not obvious under 35 U.S.C. §103(a) over Song in view of Saleh.

Amended claim 11 reads, in part, as follows: “wherein the first remote distribution node has a plurality of band splitting filters, and a first multiplexer/demultiplexer and a second multiplexer/demultiplexer coupled to the plurality of band splitting filters, wherein the first remote distribution node is configured to connect to the second remote distribution node coupled to at least two optical network units, wherein each of the first remote distribution node and the second remote distribution node are configured to separate at least one wavelength channel from the first composite optical signal distributed through that remote distribution node.” (emphasis added).

In view of the above discussion, even if Song and Saleh were combined, such a combination would still lack a first remote distribution node and a second remote distribution node connected to each other sequentially between a central office and a plurality of optical network units, wherein the first remote distribution node has a plurality of band splitting filters, and a first multiplexer/demultiplexer and a second multiplexer/demultiplexer coupled to the plurality of band splitting filters, wherein the first remote distribution node is configured to connect to the second remote distribution node coupled to at least two optical network units, wherein each of the first remote distribution node and the second remote distribution node are configured to separate at least one wavelength channel from the first composite optical signal distributed through that remote distribution node, as recited in amended claim 11.

Therefore, applicants respectfully submit that claim 11, as amended, is not obvious under 35 U.S.C. §103(a) over Song in view of Saleh.

Given that claims 12 and 14 depend from amended claim 11, and add additional limitations, applicants respectfully submit that claims 12 and 14 are not obvious under 35 U.S.C. §103(a) over Song in view of Saleh.

Claims 2-3 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Song in view of Saleh and further in view of U.S. Publication No. 2001/0038479 to Liu et al. (“J.Liu”).

As set forth above, even if Song and Saleh were combined, such a combination would still lack a first remote distribution node and a second remote distribution node connected to each other sequentially between a central office and a plurality of optical network units, wherein first remote distribution node includes a series of band splitting filters configured to connect to the second remote distribution node comprising a first multiplexer/demultiplexer and a second multiplexer/demultiplexer coupled to at least two optical network units, and wherein each of the first remote distribution node and the second remote distribution node are configured to separate at least one wavelength channel from the first composite optical signal distributed through that remote distribution node, as recited in amended claim 2.

Liu, in contrast, discloses a programmable add/drop multiplexer.

It is respectfully submitted none of the cited references teaches or suggests a combination with each other. It would be impermissible hindsight, based on applicants’ own disclosure, to combine Liu, Saleh, and Song.

Furthermore, even if Liu, Saleh and Song were combined, such a combination would still lack a first remote distribution node and a second remote distribution node connected to each other sequentially between a central office and a plurality of optical network units, wherein first remote distribution node includes a series of band splitting filters configured to connect to the second remote distribution node comprising a first multiplexer/demultiplexer and a second multiplexer/demultiplexer coupled to at least two optical network units, and wherein each of the first remote distribution node and the second remote distribution node are configured to separate

at least one wavelength channel from the first composite optical signal distributed through that remote distribution node, as recited in amended claim 2.

Therefore, applicants respectfully submit that claim 2, as amended, is not obvious under 35 U.S.C. §103(a) over Song in view of Saleh and further in view of Liu.

Given that amended claim 3 depend from amended claim 2, and add additional limitations, applicants respectfully submit that amended claim 3 is not obvious under 35 U.S.C. §103(a) over Song in view of Saleh and further in view of Liu.

Claims 6-10, 18 and 21 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Song in view of Saleh, and further in view of PCT Publication No. WO 03/055111 to Tervonen (“Tervonen”).

Amended claim 6 reads, in part “a first remote distribution node and a second remote distribution node between a central office and a plurality of optical network units, wherein the first remote distribution node and the second remote distribution node are connected to each other sequentially, wherein the first remote distribution node has an optical interleaver configured to couple a first composite optical signal and a second composite optical signal to a first optical cable connected to the central office, wherein the first composite signal travels on the first optical cable in a first direction, and the second composite optical signal travels on the first optical cable in a second direction opposite the first direction, and wherein the first remote distribution node is configured to connect to the second remote distribution node coupled to at least two optical network units, wherein each of the first remote distribution node and the second remote distribution node are configured to separate at least one wavelength channel from the first composite optical signal distributed through that remote distribution node.” (emphasis added).

In view of the above discussion, even if Song and Saleh were combined, such a combination would still lack a first remote distribution node and a second remote distribution node between a central office and a plurality of optical network units, wherein the first remote distribution node and the second remote distribution node are connected to each other sequentially, wherein the first remote distribution node has an optical interleaver configured to couple a first composite optical signal and a second composite optical signal to a first optical cable connected to the central office, wherein the first composite signal travels on the first optical cable in a first direction, and the second composite optical signal travels on the first optical cable in a second direction opposite the first direction, as recited in amended claim 6.

Tervonen, in contrast, discloses the interleaver connected to the downstream uni-directional fibre and to the upstream uni-directional fibre. Tervonen fails to teach or suggest the first remote distribution node having an optical interleaver configured to couple a first composite optical signal and a second composite optical signal to a first optical cable connected to the central office, wherein the first composite signal travels on the first optical cable in a first direction, and the second composite optical signal travels on the first optical cable in a second direction opposite the first direction, as recited in amended claim 6.

Therefore, applicants respectfully submit that claim 6, as amended, is not obvious under 35 U.S.C. §103(a) over Song in view of Saleh and further in view of Tervonen.

Given that amended claims 7-10 depend from amended claim 6, and add additional limitations, applicants respectfully submit that amended claims 7-10 are not obvious under 35 U.S.C. §103(a) over Song in view of Saleh and further in view of Tervonen.

Given that amended claims 18 and 21 contain some limitations that are similar to those limitations set forth above, applicant respectfully submits that claims 18 and 21 are not obvious under 35 U.S.C. §103(a) over Song in view of Saleh and further in view of Tervonen.

It is respectfully submitted that in view of the amendments and arguments set forth herein, the applicable rejections and objections have been overcome. If the Examiner believes a telephone conference would expedite the prosecution of the present application, the Examiner is invited to call the undersigned at (408) 720-8300.

If there are any additional charges, please charge Deposit Account No. 02-2666.

Respectfully submitted,

BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP

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/Tatiana Rossin/

Tanya Rossin

Reg. No. 56,833

1279 Oakmead Parkway
Sunnyvale, California 94085-4040
(408) 720-8300

Customer No. 08791